PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
(Our Case No. MBHB 01-175-B)

In re Application of:		)	
		)	
	Donald M. Bellenger	)	Examiner: Phuongchau Ba Nguyen
		)	
Serial No.	09/245,442	)	Art Unit: 2665
		)	
Filed:	February 4, 1999	)	
		)	
For:	"Method For Statistical Switching"	)	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO THE OFFICE ACTION
MAILED MAY 3, 2006

Dear Sir:

The Applicants submit the following remarks in response to Office Action mailed June 30, 2006 in connection with the above-identified application. Amendments begin on page 2; Remarks begin on page 8.

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AMENDMENTS

In the claims:

1. (currently amended) A method of switching ~~a~~ an Ethernet packet, the method comprising:

computing a tag for the Ethernet packet, said tag computed using two or more fields in said packet, wherein said fields are selected from Ethernet and network headers in said packet;

looking up the computed tag in a table, the table ~~comprised of~~ containing entries associated with tags, the entries associating switching information with a tag, said switching information defining a route through a plurality of interconnected switch nodes; and

using said switching information associated with the computed tag from ~~in~~ the table to switch the packet, if there is an entry for the computed tag in the table.

2. (currently amended) The method of claim 1, wherein the method of switching an Ethernet packet further comprises ~~determining the switching information if there is no entry for the tag in the table and the determining comprising~~ sending the packet to a system with resources for routing a packet and for determining switching information.

3. (currently amended) The method of claim 2, further comprising updating the table to include an entry for the computed tag, and wherein the computed tag is associated with the determined switching information ~~responsive to the determining~~.

4. (currently amended) The method of claim 2, further comprising including an entry in the table for the computed tag associated with a switching instruction indicating that packets should be dropped until the determining of switching information is complete.

5. (previously presented) The method of claim 1, wherein the entries in the table are removed if the tag corresponding to the entry has not been looked up in a predetermined period.

6. (original) The method of claim 5, wherein the length of the tag is determined by the predetermined period, the number of entries in the table, and the probability of two packets generating the same tag.

7. (original) The method of claim 1, wherein a plurality of tags are generated for the packet, the plurality of tags corresponding to a plurality of flow detectors.

8. (original) The method of claim 7, wherein a plurality of tables are maintained, each table corresponding to one of the flow detectors.

9. (original) The method of claim 7, wherein each of the tags in the plurality of tags includes information about the associated flow detector.

10. (original) The method of claim 7, wherein an error rate of the method is measured based on the number of matches between tags in the table without regard to which flow detector is associated with a tag.

11. (original) The method of claim 10, wherein a warning is issued when the error rate exceeds a predetermined level.

12. (currently amended) The method of claim ~~10~~ 5, wherein the predetermined period for which entries in the table are retained without being looked up is decreased when the error rate increases above a predetermined level.

13. (currently amended) The method of claim ~~10~~ 5, wherein the predetermined period for which entries in the table are retained without being looked up is increased when the error rate decreases below a predetermined level.

14. (original) The method of claim 7, wherein the plurality of tags are computed in parallel by the plurality of flow detectors.

15. (original) The method of claim 7, wherein each of the plurality of tags computed by the plurality of flow detectors are the same length.

16. (original) The method of claim 7, wherein the plurality flow detectors are associated with a priority, and wherein the switching occurs according to the priority of the flow detector.

17. (original) The method of claim 7, wherein the error rate of the switching system is measured based on the number of cross flow detector tag matches in the table.

18. (original) The method of claim 1, wherein the computing further comprises using a mask of bits of the packet as a seed for a hash code generator.

19. (original) The method of claim 18, wherein the hash code generator is a pseudo random number generator.

20. (original) The method of claim 18, wherein the hash code generator is a shift register with a feedback loop.

21. (original) The method of claim 18, wherein the hash code generator has a non-zero probability of generating the same tag from different input packets.

22. (original) The method of claim 18, wherein the length of the tag is determined by the probability of the hash code generator producing the same hash code from different input packets.

23. (currently amended) A method comprising:

computing a tag for ~~a~~ an Ethernet packet, said tag computed using at least two fields in said packet, wherein said fields are selected from Ethernet and network headers in said packet;

looking up the computed tag in a table, the table comprised of entries, the entries associating information about ~~the~~ packet flows with tags, the information including route information specifying a route through a plurality of interconnected switch nodes;

updating information about the packet flow associated with the computed tag if there is an entry for the computed tag;

creating a new entry in the table if there is no entry for the computed tag; and

removing entries that have not been accessed for a predetermined period from the table.

24. (original) The method of claim 23, wherein the creating further comprises storing data extracted from the packet in the entry.

25. (original) The method of claim 24, wherein the data includes billing information for the packet.

26. (original) The method of claim 24, wherein the packet is sent to a system with resources for analyzing the packet and determining billing information to be associated with the entry for the computed tag.

27. (original) The method of claim 23, wherein the removing further comprises transferring the data associated with a tag to a system with resources for storing information.

28. (original) The method of claim 23, wherein the computing further comprises using a mask of bits of the packet as a seed for a hash code generator.

29. (original) The method of claim 28, wherein the hash code generator is a pseudo random number generator.

30. (original) The method of claim 28, wherein the hash code generator is a shift register with a feedback loop.

31. (original) The method of claim 28, wherein the hash code generator has a nonzero probability of generating the same tag from different input packets.

32. (original) The method of claim 28, wherein the length of the tag is determined by the probability of the hash code generator producing the same hash code from different input packets.

33. (New) The method of claim 23, wherein said fields used to computed said tag are selected from Ethernet and network headers in said packet.

34. (New) The method of claim 23, wherein said fields used to compute said tag are specified by a template, said template specifying fields for a particular protocol.

35. (New) The method of claim 34 wherein said protocol is the real time protocol (RTP).

36. (New) The method of claim 34 wherein said protocol is the hyper-text transfer protocol (HTTP).

37. (New) The method of claim 1 wherein said fields used to compute said tag are specified by a template, said template specifying fields for a particular protocol.

38. (New) The method of claim 37 wherein said protocol is the real time protocol (RTP).

39. (New) The method of claim 37, wherein said protocol is the hyper-text transfer protocol (HTTP).

40. (New) The method of claim 7, wherein each flow detector is loaded with a template for detecting a different protocol.

REMARKS

1. Summary of the Office Action

In the office action mailed May 5, 2006, the Examiner rejected claims 1-5, 7-10, 14-21 and 23-31 as being allegedly obvious in view of U.S. Patent 6,018,526 (Liu) and US Patent 6,044,079 (Calvignac). The Examiner also indicated that claims 6, 11-13, 22, and 32 would be allowable if re-written to include the elements of the base claims.

2. Status of the Claims

Presently pending are claims 1-32, of which claims 1 and 14 are independent and the remaining claims are dependent. Applicant has added new claims 33-40, all of which are dependent.

3. Response to Rejections

As noted above, the Examiner rejected claims 1 and 23 as being obvious in view of Liu and Calvignac. However, Applicant respectfully suggests that the cited references do not render obvious the presently claimed invention. Accordingly, Applicant traverses the rejections and respectfully requests reconsideration.

Applicant's pending independent Claims 1 and 23 set forth a method for switching packets in a switch fabric. The methods include the steps of computing a tag for the packet, and associating switching information with a tag. The claims have been amended to clarify that the switching information is generated from Ethernet and network headers in the packet. These amendments are supported by the originally filed specification, and no new matter has been added to this application, as required by 37 CFR 1.121. Applicant respectfully requests allowance of these claims because the cited references do not include the limitations of claims 1 and 23. Additionally, since the remaining claims depend from Claims 1 or 23, these Claims also include the above limitation and are thus allowable for at least the same reasons as Claims 1 and 23. Accordingly, all pending claims are allowable and the indication of allowance is earnestly requested.

A. Liu Does Not Disclose The Computation of Tags from Ethernet and Network Headers

In contrast to the present invention, Liu discloses a bridge device with self-learning for interconnecting network LAN segments (col. 1, lines 8-10). Liu does not disclose computing tag values based on a combination of Ethernet and network header fields, nor does it correlate the hash values to routing information through a plurality of interconnected switch nodes. Liu simply hashes address values and then uses the hash values to determine if a "node exists on a particular side of the bridge." (Liu, col. 5, lines 45-46).

B. Calvignac Does Not Cure the Deficiencies of Liu

Calvignac relates to ATM technology using VCI, VPI, and port information to determine whether a data cell is to be discarded. Calvignac does not describe computing tag values based on a combination of Ethernet and network header fields, nor does it correlate the hash/tag values to routing information through a plurality of interconnected switch nodes. Thus, it is evident that Calvignac does not cure the deficiencies of Liu.

4. Conclusion

Independent claims 1 and 14 are therefore in condition for allowance. The remaining claims are dependent from claims 1 and 14 and are allowable for at least the reasons set forth above. For these reasons, Applicant respectfully requests favorable reconsideration and allowance of all of the pending claims. Should the Examiner wish to discuss this case with the undersigned, the Examiner is invited to call the undersigned at (312) 913-3305.

Respectfully submitted,

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